A. CESÀRO.

PUSH BUTTON SWITCH FOR ELECTRIC CURRENT.

APPLICATION FILED SEPT. 23, 1919.

1,383,527. **Patented July 5, 1921.**

Fig. 1

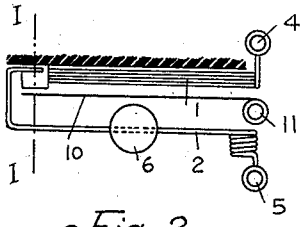


Fig. 2

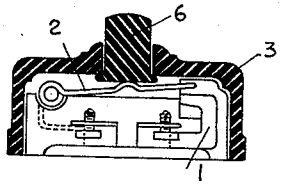


Fig. 3

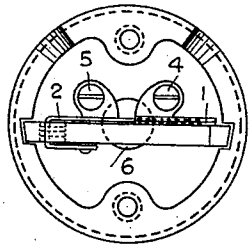


Fig. 4

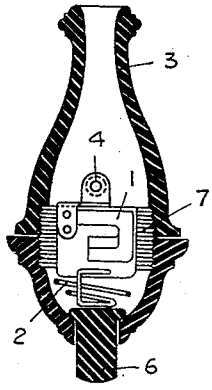


Fig. 5

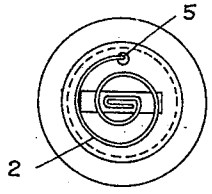


Fig. 6

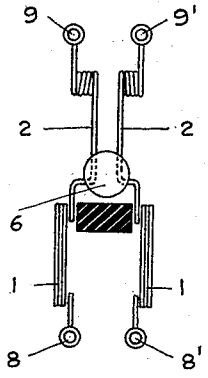


Fig. 7

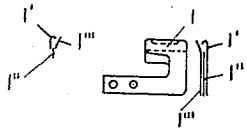


Fig. 8

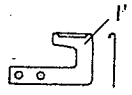


Fig. 9

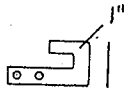


Fig. 10

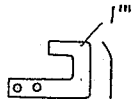


Fig. 11

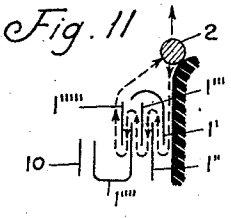


Fig. 12

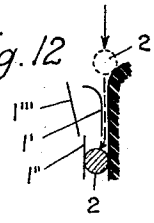


Fig. 13

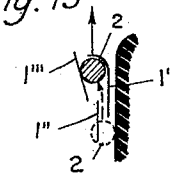


Fig. 14

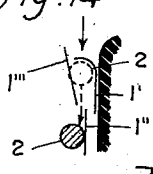
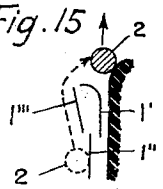


Fig. 15



Inventor
A Cesàro
By H. R. Kerslake.
Attorney

UNITED STATES PATENT OFFICE.

ATTILIO CESÀRO, OF GENOA, ITALY.

PUSH-BUTTON SWITCH FOR ELECTRIC CURRENT.

1,383,527. Specification of Letters Patent. Patented July 5, 1921.

Application filed September 23, 1919. Serial No. 325,789.

To all whom it may concern:

Be it known that I, ATTILIO CESÀRO, a subject of the King of Italy, residing at Via Napoli 13, Genoa, Italy, have invented certain new and useful Improvements in Push-Button Switches for Electric Current, of which the following is a specification.

This invention relates to electric switches of the push button type its object being to provide a very simple inexpensive construction in which a spring terminal actuated by the push button is caused with its free end to be engaged or disengaged from the free end of a bundle of flexible elastic metal strips in contact with a second terminal so as to effect the closing and opening of the circuit.

In the accompanying drawings:

Figure 1 shows diagrammatically a switch according to the present invention applied to two electric circuits.

Figs. 2 and 3 illustrate in section and in plan an ordinary one circuit wall switch including the improvements of the present invention.

Fig. 4 is a vertical sectional view of an ordinary one circuit suspension switch according to the present invention.

Fig. 5 is a plan view of the lower half of the same.

Fig. 6 is a diagrammatical view of a four-pole switch according to the present invention, for closing and opening a main circuit.

Fig. 7 shows a detail view of the bundle of strips forming part of the invention.

Figs. 8, 9 and 10 show details of the several strips forming the bundle used in connection with a one circuit switch.

Fig. 11 is a section on the line 1—1 of Fig. 1.

Figs. 12, 13, 14 and 15 show diagrammatically and on a larger scale the four conditions produced by two consecutive pushes of a one circuit switch.

In these figures the leaf bundle 1 consists of the three leaves 1′, 1″, 1‴, which are fastened together on one end, having however a special shape on their other free ends, where the coupling and the uncoupling with the spring take place. In this part the two outer leaves 1′ and 1‴ (Figs. 7, 8, 9 and 10) are of the same height and arranged on the same level with respect to the plane of the displacement of the spring. Besides the one of these outer leaves 1′, has on its upper edge a bend toward the inside of the bundle and the other one, 1‴, arranged and shaped to lean against the bend of leaf 1′ and to slightly pass with its upper edge this bend. The inner leaf 1″ has in this part its upper edge situated so as to correspond with the lower edge of the leaves 1′ and 1‴, its lower edge however extending slightly over the travel described by the spring.

There is now described the working of the coupling and uncoupling of the two elastic poles, as diagrammatically illustrated in Figs. 12, 13, 14 and 15. In effecting a first push on the button of the switch (Fig. 12), the spring 2 with its free end slides along the wall of the switch, displacing the bundle 1 and before the end of the travel releases the leaf 1′ which returns in its original position, while the leaves 1″ and 1‴ remain displaced by the spring. In liberating the button (Fig. 13) the spring 2 releases the leaves 1″ and 1‴ and in sliding over the leaf 1′ stops within the bend of this leaf. In this manner the two elastic poles remain engaged and the closing of the circuit is effected. In pushing again on the button (Fig. 14) the spring 2 in traveling between the leaves 1′ and 1‴ slides over the leaf 1″ in releasing the leaf 1‴. In liberating again the button (Fig. 15), the spring 2 returns in sliding over the leaf 1‴ in its original position resulting in the opening of the electric circuit.

In Figs. 2 and 3 are illustrated a common wall switch in which 1 is the leaf bundle as above described, fixed with its one end on the box 3 and in contact with the terminal clamp 4; 2 is the spring also fixed against the box 3 and in contact with the terminal clamp 5, which spring by its free end and by pushing the button 6 can be engaged or disengaged with or from the leaf bundle as above described.

Figs. 4 and 5 show a suspension switch in which the leaf bundle 1 is fixed upon a sleeve 7 fastened with the box 3 and in contact with the terminal clamp 4. 2 is a spiral spring fixed against the box 3 and in contact with the terminal clamp 5 which spring in pushing the button 6 by its free end is engaged with or disengaged from the leaf bundle 1 as above described.

In Fig. 6 is illustrated a switch having four poles for the closing and opening of both conductors of a main circuit. In this

device the terminal clamps 8 and 8′ bear each one a leaf bundle 1 as already described and the other terminal clamps 9 and 9′ each one a spring 2 at a convenient distance from each other and controlled by a common button 6.

In Figs. 1 and 11 there is illustrated a switch device having three poles allowing to lighten one or two groups of lamps inserted on two electric circuits. In this device the leaf bundle is fastened with its one end in contact with the terminal clamp 4 while the spring 2 on its fixed end is in contact with the terminal clamp 5; 10 is a sheet connected with a third terminal clamp 11. The leaf bundle consists in five leaves of which in the first push of the button, the spring 2 releases the two first leaves 1′ and 1″ while the other three 1‴, 1⁗ and 1⁗′ remain displaced and the 4th leaf 1⁗ coming in contact with the sheet 10, whereby the closing of two circuits is effected. On the second push of the button 6, the 3rd and 4th leaf 1‴ and 1⁗ are getting released and the circuit formerly established by spring 2 and sheet 10 opened. On the third push of the button 6, the spring 2 abandons entirely the leaf bundle 1, whereby also the second circuit is opened.

I claim:—

1. An electric switch including a terminal, a spring connected to said terminal and having a free end, means for moving the free end of said spring, a second terminal, a bundle of conductor strips connected to the second terminal and having free ends coöperating with the free end of said spring for establishing an electric circuit, said strips being arranged side by side and one edge of one of the outer strips having an extension directed toward the other outer strip, the free end of the two outer strips being arranged opposite each other and the free end of the intermediate strip having its major portion arranged below the lower edges of the free ends of the outer strips, the free end of the spring when the operating means is actuated, being adapted to pass around the edge of the first mentioned strip which is operative to the extension of said strip and then moved between the strip having the extension and the intermediate strip until it engages said extension.

2. A switch of the kind defined by claim 1 in which two additional strips are arranged alongside the bundle of strips, one of the additional strips being provided with an outwardly extending portion, and a third terminal having a bar designed to be engaged by the outwardly extending portion of one of said additional strips.

3. An electric switch including a first terminal, a spring connected to said terminal and having a movable free end, a push-button engaging said spring for moving its free end, a second terminal, three L-shaped strips connected to said second terminal and having free ends, the free ends of said strips being arranged side by side and the free end of one of the outer strips being provided at its outer edge with an extension which is directed toward the free ends of the other strips, the free end of said spring, when the push-button is depressed, being designed to pass below, the lower edge of the free end of the strip provided with the extension and when released being automatically movable upwardly between the last mentioned strip and the intermediate strip, the free end of said spring on the second depression of said button being designed to pass downwardly between the intermediate strip and the other outer strip to release said spring from the strips.

4. An electric push button switch, including a first terminal, a spring connected to said terminal, a push button engaging said spring, a second terminal, a bundle of three strips connected to said second terminal and having a free end engaged by a free end of said spring, the free ends of the two outer strips in the part where the connection and disconnection takes place being situated opposite each other and substantially within the plane of movement of the free end of the spring, one of the outer strips having its upper edge provided with an extension which is directed toward the other strips, the free end of the middle strip being arranged below the upper edges of the other strips, and the free end of the spring being adapted, when the push button is initially pressed, to pass below the free end of the strip having the extension and, when the button is released, to move upwardly between the strip having the extension and the middle strip and engage said extension.

5. An electric push-button swtich including a spring in contact with a terminal clamp and operated by a push-button, the said spring having its free end engaged or disengaged with the free end of a bundle of three strips, in contact with a second terminal clamp, the free ends of the two outer strips in the part where the connection and disconnection takes place being situated opposite each other and substantially within the plane of movement of the spring, and one of these outer strips being formed on its upper edge with an extension directed toward the inside of the bundle, and the other outer strip being arranged to rest against the extension of the first strip, the free end of the middle strip at this first part being situated to correspond at its upper edge with the lower edge of the outer strips and to extend with its lower edge beyond the travel of the spring, the arrangement being such that on the button being pressed a first time the elastic spring is engaged within the ex-

tension of the strip so as to close the circuit, whereas on the button being pressed a second time the said spring is disengaged from the bundle and the circuit is opened.

6. An electric push button switch characterized by a thin plate in contact with a first terminal clamp and a spring in contact with a second terminal clamp and operated by a push-button, said spring having its free end engaged with or disengaged from the free end of a bundle of five strips in contact with a third terminal clamp, the free ends of the first, third and fifth strips at the part where the connection and disconnection takes place being situated opposite each other and substantially within the plane of the movement of the spring; one of the outer of these three strips being formed at its upper edge with an extension directed toward the inside of the bundle, the free ends of the two other strips at this part being however, so situated that their upper edges correspond with the lower edges of the three first mentioned strips and their lower edges extend beyond the travel of the spring; the arrangement being such that when the button is pressed a first time, the elastic spring, by its engagement with the extension, and by contact made between the bundle and the plate connected to the first terminal clamp, will close the two circuits; one circuit being operated by a second pressing of the button, and the second circuit also being opened by a third pressing of the button.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ATTILIO CESÀRO.

Witnesses:
ADOLFO WEBER,
N. P. SHOCKLEY.